

ABSTRACT OF THE DISCLOSURE

A computer-implemented method is provided for valuing and hedging payoffs that are determined by an underlying non-marketed variable that moves randomly [200]. The value assigned is that which is obtained by projecting the instantaneous return of the future payoff onto the span of marketed assets. An explicit method is provided for determining this value by determining a suitable market representative [210]. In a continuous-time embodiment, the methodology is based on an extended Black-Scholes equation [220] that accounts for the correlation between the underlying non-tradable asset and marketed assets. Once this extended equation is solved [210], the value of the payoff, the optimal hedging strategy [240], and the residual risk of the optimal hedge can be determined [250]. In alternate embodiments, the same value is determined as the discounted expected value of the payoff, using risk-neutral probabilities for the non-marketed variable. These risk-neutral probabilities are again determined by the relation of the underlying variable to the payoff of a most-correlated marketed asset. The risk-neutral version of the method applies in both continuous-time and discrete-time frameworks, providing asset valuation, optimal hedging, and evaluation of the minimum residual risk after hedging.